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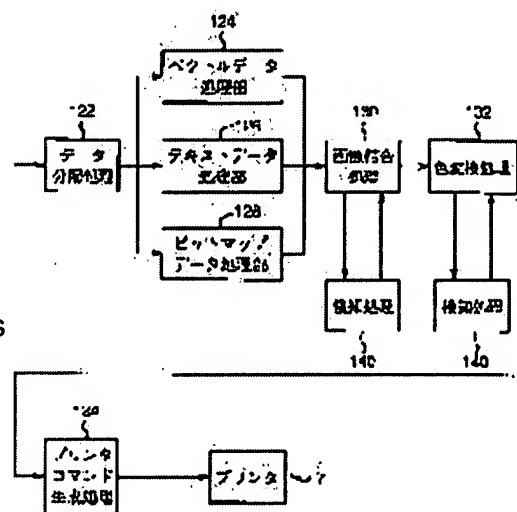
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(54) IMAGE PROCESSING UNIT, PRINT SYSTEM AND IMAGE PROCESSING METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To reliably acquire and defect the image data of a specific pattern at the time of outputting an image.

SOLUTION: The print system that processes received data and outputs processed data is provided with a detection means that detects whether received data or data after the above processing include data corresponding to a specific pattern. The detection means is placed at a position through which all data pass until the received data are outputted. The position is e.g. a position at which an RGB value given to detection processing is correlated to the color of a printout or a position in a printer driver in which an image always flows.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image processing for forged prevention.

[0002]

[Description of the Prior Art] In recent years, the function and engine performance of peripheral devices (a scanner, color printer, etc.) of a computer are improved, and forgery of an elaborate bill or negotiable securities can perform [ordinary consumers] now easily. For this reason, the effective forged prevention approach is continuing being examined. The method of putting the specific pattern into the inside of a bill etc. is in one of the forged prevention approaches. If the input image data obtained by the input device is analyzed and a specific pattern is detected in an image in the case of an image output, the normal image generation in output equipment will be forbidden.

[0003]

[Problem(s) to be Solved by the Invention] However, there is various image data flow from an input device to output equipment. Therefore, when input image data is analyzed and a specific pattern is detected in an image, it is not easy to catch image data certainly and to detect a specific pattern also in the approach of forbidding the normal image generation in output equipment.

[0004] The purpose of this invention is catching and detecting the image data of a specific pattern certainly in the case of an image output.

[0005]

[Means for Solving the Problem] The image processing system concerning this invention is an image processing system which processes and outputs the inputted data, and has a detection means to detect whether the data applicable to a specific pattern are contained in the inputted data or the data after the above-mentioned processing. This detection means is inserted in the location via which all data will go by the time it outputs the above-mentioned input data. For example, when the above-mentioned input data is data of a color picture, let the location of the above-mentioned detection means be the location which correspondence of an input color and an output color attaches. Moreover, for example, when the above-mentioned input data is data of a multiple-value image, let the location of the above-mentioned detection means be the location which correspondence of an input value and an output value attaches. The above-mentioned image processing system has preferably a storage means to memorize the data after the above-mentioned processing, further, and let the location of the above-mentioned detection means be the location before memorizing data for the above-mentioned storage means. In the above-mentioned image processing system, the above-mentioned detection means is located in the driver software which controls output equipment. The above-mentioned image processing system has a transmitting means to transmit to the output equipment to which the data after processing were connected in the network further preferably. The above-mentioned image processing system has a receiving means to receive further preferably from the input device to which the input data was connected in the network.

[0006] The printing system concerning this invention is a printing system which connected the image

processing system which processes and outputs the data by which human power was carried out, and the airline printer which prints the outputted data by network UKU. It has a detection means to detect whether the data applicable to a specific pattern are contained in the inputted data or the data after the above-mentioned processing, and the above-mentioned detection means is inserted in the location via which all data will go by the time it outputs the above-mentioned input data. For example, when the above-mentioned input data is data of a color picture, let the location of the above-mentioned detection means be the location which correspondence of an input color and an output color attaches. Moreover, for example, when the above-mentioned input data is data of a multiple-value image, let the location of the above-mentioned detection means be the location which correspondence of an input value and an output value attaches.

[0007] The record medium concerning this invention in which computer reading is possible records the image-processing program which consists [whether the data applicable to a specific pattern are contained in the data inputted as the step which inputs and processes data, or the data after the above-mentioned processing, and] of a step detected in the location via which all data will go by the time it outputs the above-mentioned input data.

[0008] By the image-processing approach concerning this invention, it detects whether the data applicable to a specific pattern are contained in the inputted data or the data after the above-mentioned processing in the image processing which processes and outputs the inputted data in the location via which all data will go by the time it outputs the above-mentioned input data.

[0009]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to an attached drawing. In addition, in a drawing, the same reference designator shows a same or equivalent thing.

[0010] In the printing system incorporating a forged prevention function, if the existence of the specific pattern put into the inside of a bill etc. is detected from image data and a specific pattern is detected, an image output will be forbidden. Although there is various image data flow from an input device to output equipment, if it considers that the output to paper is the last purpose in order to catch image data certainly, it is optimal to give the plan of forged prevention around output equipment. Also in it, it is most effective to put image data into the location caught certainly in the driver treating output equipment etc. Moreover, only when an output object is the same color as a genuine article, in order to detect, an output color needs to be known in the location which performs detection processing. Then, if it includes in the location via which all data go on the occasion of incorporating the detection processing for forged prevention, forged prevention can be performed certainly and effectively. The location is the location which the correspondence of a RGB value and the color of a printed output inputted for example, into detection processing attaches, and a location where an image always flows within a printer driver.

Various examples are explained below.

[0011] Drawing 1 shows a printing system. This system forbids an output, when a forged prevention function is incorporated, the specific pattern in the data which processed appropriately input image data or input image data is detected and a specific pattern is detected. A computer 1 controls the whole system. A computer 1 is constituted considering CPU, ROM, and RAM as a core, and contains the hard disk drive unit 6 and CD-ROM equipment 9b which treat further the hard disk which is a storage, CD-ROM9a, flexible disk 5a, etc., and flexible disk equipment 5b. The image-processing program explained later is read from a record medium. A scanner 8 is connected to a computer 10 as an image input means for incorporating image data, and the printer 7 for outputting image data is connected to it. Furthermore, a computer 1 is connectable with other image input means and image output means through a network 10. The above-mentioned system configuration is common also in other operation gestalten explained later. In addition, although the program which controls a system is memorized in this system to CD-ROM which is a record medium, it may read from other record media and you may make it perform. Moreover, although the scanner 8 is used as an image data entry unit, this may be other input devices, such as a digital camera. Moreover, although considered as the printer as an output unit, this may be other output units, such as a digital copier.

[0012] Drawing 2 shows the flow of print-data processing. A computer 1 is equipped with a printer driver 120 and the specific pattern detection section 140 in this printing system. A printer driver 120 takes charge of the part which outputs the data in a computer 1 to a printer 7. If data are more specifically passed to a printer driver 120 after application 100 performs edit or a check for data, the conversion doubled with the property of a printer will be made inside a printer driver, and print data will be sent and printed by the printer 7. When printing an image by the printer, the printer driver 120 of a computer sends print data to a receipt and a printer 7 from application 100. Here, there are various gestalten in the engine performance of the controller of a printer 7, and the engine performance of a printer driver 120. With this operation gestalt, only simple processing in which the controller of a printer 7 prints input image data as it is shall be carried out, and a printer driver 120 shall carry out various processings about image data.

[0013] As the target data are image data and it is shown in drawing 2, when application 100 directs printing of image data in forged prevention, image data is sent to a printer 7 through a printer driver 120. A printer driver 120 takes charge of the part which outputs the data in a computer 1 to a printer 7. If data are more specifically passed to a printer driver 120 after application performs edit or a check for the data in a computer 1, the conversion doubled with the property of a printer 7 will be made inside a printer driver 120, and will be printed by the printer 7. The detection processing section 140 is further formed for forged prevention. A printer driver 120 sends a printing allow command to a printer driver 120, when the inputted image data is handed over in the detection processing section 140 and the detection processing section 140 does not detect a specific pattern, but if a specific pattern is detected, it will send a printing prohibition command to a printer driver 120. An output control is performed in consideration of the printing enabling signal from the detection processing section 140.

[0014] Drawing 3 shows one example of the specific pattern detection processing in the detection processing section 140. First, the multiple-value color picture of a detection processing object is inputted (S10). Next, a color picture is made binary (S12). In binary-izing of a color picture, if the RGB value of each pixel is within the limits of assignment, a bit will be turned ON, and if it is the color of the other range, a bit will be turned OFF. For example, the bit of a pixel will be turned ON if it agrees on the following conditions.

$\text{RedMax} \leq \text{Red} \leq \text{RedMin}$ And $\text{GreenMax} \leq \text{Green} \leq \text{GreenMin}$ and $\text{BlueMax} \leq \text{Blue} \leq \text{BlueMin}$ --
 Red, Green, and Blue are the pixel values of an attention pixel, RedMax, GreenMax, and BlueMax are the upper limits of R, G, and B here, and RedMin, GreenMin, and BlueMin are the lower limits of R, G, and B. Next, in order to accelerate processing, the image data for recognition is dropped on required resolution (fineness of an image) (S14). Next, in order to detect a specific pattern (for example, circular configuration of specific magnitude) to a binary-ized image, it scans with a filter and pattern matching detects a specific pattern (S16). And output authorization is judged from the result of pattern matching (S18). If whenever [with a specific pattern / matching] is large, it will judge with the image against an output.

[0015] As for drawing 4, the print driver 120 shows the processing from which it changes into the data for a printer output when print data have been sent from application. First, by the data distribution processing section 122, input data is analyzed and processing is divided for every kind of data. Vector data is developed by bit map data by the vector data processing section 124, text data is developed by bit map data according to a font size, a font, etc. by the text data processing section 126, and bit map data are developed by the bit map in consideration of a location, a lap, and resolution in the bit map data-processing section 128. In the image joint processing section 130, the bit map data from each processing section are combined, and the bit map data for 1 page are generated. The bit map data finally developed are sent to the detection processing section 140. The detection processing section 140 detects whether a specific pattern is contained, and returns a detection result. Since this image joint processing section 130 has image data in the location which surely flows, the detection processing section 140 is receiving image data from this location, and it does not have the omission of prehension of image data. (In addition, the detection processing section 140 can also be arranged in the location of the color transform-processing section 132, and is explained with reference to drawing 5 about this later.) Next, it

is the color transform-processing section 132, and multiple-value RGB data are set by the property of a printer 7, and are changed into CMYK data. Next, printer control command is generated in the printer command generation processing section 134, and it sends to a printer 7. If there is need, it will send to CMYK data at a printer 7.

[0016] Since the detection processing section 140 receives data from the image joint processing section 130 with this operation gestalt, there is no omission of prehension of image data. When detection processing is put into the bit map processing section 128 compared with this, detection processing can be performed to bit map data, but when an output prohibition image is created by vector data, it becomes impossible to detect it and it is inconvenient. When an output prohibition image is outputted as a bit-mapped font, it becomes impossible moreover, to perform detection processing, since the text created by the bit map is also processed in the text data processing section 126.

[0017] Next, detection processing in the color transform-processing section 132 which changes multiple-value RGB input data into the printer output color CMYK is explained with reference to drawing 5. Since detection processing is performed according to a printer output color, exact detection cannot be performed if it does not know whether to become the color of specification [the inputted multiple-value image data / the time of a printer output]. Then, detection processing is performed by inputting the image data in the location which correspondence of multiple-value data with a printer output color attaches. Since the color parameter of the specific pattern used for detection processing is generated by backing correspondence-related [with an output color], the location into which detection processing is put is put into a suitable location depending on the approach which the color-matching approach of the print system has adopted. In addition, a color parameter is set up according to a printed output color. That is, a color chart is read and printed with a scanner 8, a printed output object is measured, matching with an input picture signal and a printed output object is performed, and a color parameter is set up based on this.

[0018] Since correspondence of an input image data RGB value and a printer output color is attached when a printer 7 is a printer of sRGB correspondence, it is the phase which inputted the RGB data which are image data, and detection processing is performed about input RGB data.

[0019] Next, in the color matching section 1320, color matching is performed about RGB data, and, as a result, R'G'B' is outputted. In corresponding to color matching by the profile, by the profile, since the correspondence relation between a print color and a R'G'B' value sticks, detection processing is carried out about R'G'B' image data.

[0020] Next, in the ink color-separation section 1322, it decomposes into the ink color CMYK about R'G'B' data. When CMYK data and the table of a printer output color exist and correspondence sticks, detection processing can be performed about CMYK data.

[0021] Next, in the half toning section 1324, half toning is performed about CMYK data and it changes into C'M'Y'K' data. Since correspondence with a pixel value and an output color stops sticking after half toning is performed, detection processing is difficult. In this way, about the data with which detection processing was made, a printer command is generated in the print command generation section 134, and a print command and C'M'Y'K' data are sent to a printer 7. As a typical thing which can apply the printer driver which has such a function, the driver for serial printers, such as an ink jet printer and a dot impact printer, can be mentioned.

[0022] Drawing 6 shows the printing system of the 2nd operation gestalt. In this printing system, printer driver 120' of a computer changes the data passed from application 100 into the Page Description Language which can interpret a printer 7, and a controller 70 changes into print data the Page Description Language received from the computer. More specifically, a printer 7 is equipped with the print engine 200, a printer controller 220, and the detection processing section 240. A printer controller 220 performs conversion doubled with the property of the print engine 200, and sends print data to the print engine 200. The detection processing section 240 performs the same processing as the detection processing section 140 of the 1st operation gestalt. A printer controller 220 sends a printing allow command to a printer controller 220, when the inputted image data is handed over in the detection processing section 240 and the detection processing section 240 does not detect a specific pattern, but if

a specific pattern is detected, it will send a printing prohibition command to a printer controller 220. A printer controller 220 performs an output control in consideration of the printing enabling signal from the detection processing section 240.

[0023] Drawing 7 shows color transform processing which the print controller 220 changes into the data for a printer output when print data have been sent from print driver 120' of a computer. Although explanation is omitted since the processing from data distribution processing section 222' to printer command generation processing section 234' is the same as processing from the data distribution processing section 122 of drawing 4 to the printer command generation processing section 134, detection processing by the detection processing section 240 is performed about the data obtained by the image joint processing section 230.

[0024] Drawing 8 shows the printing system which outputs the command for printer control generated by the printer driver using a spooler. If application 100 directs printing, the data which should be printed will be memorized through a printer driver 120 by the spool file 162 in a spooler 160. In a printer driver 120, image data is sent to the detection processing section 140, and delivery and the detection processing section 140 send a judgment result to a printer driver 120. Thus, the detection processing section 140 performs detection processing in front rather than it generates a spool file 162. The data of the page of the output schedule which finished detection processing are stored in a spool file 162.

Therefore, the result of detection processing can perform the output control of printer 7 HE. The file 162 in a spooler 160 is printed in a printer 7. Since the upstream has detection processing from a spool file 162, it can consider as printing disapproval before an output.

[0025] With this operation gestalt, the data of the page of the output schedule which finished detection processing are stored in the spool file. Since the detection processing section 140 is in the upstream rather than a spool file 162, the output control in a page unit becomes possible. Control of authorization/disapproval of an output is performed by the following approaches per page. Approach 1: A printer driver 120 sets a flag that an output is possible and improper for every page. A spooler 160 outputs only a page with a good output to a printer 7. Approach 2: A printer driver sends a signal that an output is possible, and improper for every page to a spooler 160. A spooler 160 outputs only a page with a good output to a printer 7.

[0026] Drawing 9 shows another printing system which outputs the command for printer control generated by the printer driver using a spooler. A different point from the printing system explained by drawing 8 above is explained below. In this system, the data which printer driver 120' should print are changed into a drawing command, and it memorizes to spool file 162'. Then, printer driver 120' changes this drawing command into the data for a printer output, and delivery and detection processing section 140' sends that data to detection processing section 140', and it sends a judgment result to printer driver 120'.

[0027]

[Effect of the Invention] Since an image detects an image in the location via which it always goes at the time of an output, the omission in detection of the image which must not be outputted can be prevented. That is, it faces printing out, and since it is the location which cannot bypass image data, forgery can be prevented certainly. Since it detects in the location where correspondence with an input value and an output color is attached, specification of the color range of the specific color which should be detected is attained. Therefore, it becomes possible to detect certainly the image which outputs the color near a genuine article. On the contrary, since the image with which the printed-out image does not resemble a genuine article is not detected, it can prevent incorrect recognition.

[Translation done.]